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DO NOT ENTER – Deliver directly to Examiner Delma R. Flores Ruiz

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Dear Examiner Flores Ruiz,

Attached is our proposed discussion points for the interview of USSN **09/513,702** in preparation for our interview on **Tuesday, February 12, 2002**, approximately 2 PM.

We filed a new Power of Attorney in the case. A courtesy copy of it is attached hereto.

If you need to have this telefax re-transmitted, please contact my assistant Diana Castillo at 415-351-5757, and she will re-send it for you.

Thank you for your time and consideration on this case.

Best regards,

Hal R. Yeager
(Direct 415-351-5735)

#11 POA
M. Brunson
6/13/02

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): MUKAIHARA, *et al.*

Serial No.: **09/513,702**

Filing Date: February 25, 2000

For: Semiconductor Laser Device

Examiner: Delma R. Flores Ruiz

Client Ref: P1168

CERTIFICATE OF MAILING/TRANSMISSION (37 C.F.R. § 1.8A)

I hereby certify that this correspondence is, on the date shown below, being:

( ) deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231.

( ) transmitted by facsimile to the Patent and Trademark Office.

Jan 23, 2002
Date

Diana R. Castillo
Diana R. Castillo

POWER OF ATTORNEY (REVOCATION OF PRIOR POWERS)

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Revoking any and all powers of attorney and authorization of agent heretofore made in respect to this application, the inventors in this application hereby appoints the following as its attorneys, with full power of substitution and revocation, to prosecute this application and to transact all business in the United States Patent and Trademark Office connected therewith and requests that all correspondence in respect to this application be directed to:

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U.S.S.N. 09/513,702

Proposed Response to the Objections to the Specification and Drawings.

In the Office Action, the Specification and Drawings were objected to because it is not clear whether FIGS. 1-5 and the description thereof are related to the prior art or to the present invention. In discussing this with the inventors it was determined that what is described under the heading "Prior Art" is more in the nature of the background of the invention. This discussion describes the inventors' thinking processes and efforts which resulted in the present invention.

Applicants' proposed specific response is as follows:

1. Applicants propose to move the section of text starting on page 1, line 26 through page 6, line 3 to the beginning of the "Detailed Description of the Preferred Embodiments" section. The text from page 1, line 26 through page 6, line 3 describes the investigations that the inventors undertook to develop and invent the present invention, and further describes the new knowledge gained by their investigations. This knowledge is clearly indicated at page 3, lines 7-8 of the original Specification as being new knowledge which is not part of the prior art.
2. Applicants proposed to amend the sub-heading "Prior Art" on page 1, line 13 to read as follows: "Background of the Invention"
3. Applicants proposed to conclude the "Background of the Invention" section with the following paragraph: "One basic requirement for a pumping laser diode is that its optical output power increase in a substantially smooth manner at high optical output powers as the driving current to the laser diode is increased. However, when the above-described laser diodes are attempted for use in pumping laser applications, it often found that these laser diodes do not have smooth curves at the high power levels required by pumping applications. The lack of smoothness is evidenced by the presence of kinks in the graph of optical output power versus driving current for the laser diodes. Such kinks are similar to those show in FIG. 3, which arose from the inventors' investigations and which is more fully described below."

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4. Applicants propose to indicate in the Specification that L ≥1200 μm in FIGS. 1 and 2 to further identify these figures as pertaining to the present invention.
5. FIGS. 4 and 5 present novel results obtained by the Applicants through their investigations. As Applicants believe that these novel results are not recognized in the prior art, Applicants believe that these figures should remain identified as being part of the present invention.
6. Applicants propose to submit a Supplemental Patent Declaration to aver to these amendments.

Response to the Rejections of the Claims under 35 U.S.C. §103

Claims 1-8 were rejected under 35 U.S.C. §103 as being obvious over FIGS. 1 and 2 of the application and pages 1-6 of the specification. These parts of the Application were perceived by the Examiner as being part of the prior art admitted by Applicants. With the above proposed amendments, Applicants have clarify that the parts relied upon by the Examiner for this rejection are, in fact, part of Applicants' invention. Accordingly, the rejection is rendered moot.

Proposed Voluntary Amendments to the Claims.

1. **(Once Amended)** A semiconductor **pumping** laser device comprising:

a resonator cavity having a first end face and a second end face, and comprising a cavity portion between the first and second end faces, the cavity portion having a length greater than or equal to 1200 μm and a width that can only support a single transverse mode;

a laminated structure of a semiconductor material including an active layer ~~**formed of a**~~ **comprising at least one** quantum well structure**, said laminated structure being formed on a substrate and disposed in said cavity portion**;

a low-reflection film **formed having a reflectance of 5% or less** on one end face of the structure; **and**

a high-reflection film **having a reflectance of 80% or more** formed on the other end face of the structure~~**; and**~~

~~**the cavity length of the device being 1,200 μm or more**~~.

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Support for amendments to Claim 1:

- page 1, lines 5-11 indicates that the present invention is directed to pumping laser light.
- Page 6, line 14 indicates "pumping light source"
- Page 11, lines 16-19 disclose the reflectance values of the end faces.
- Page 5, lines 21-25 discloses single-transverse mode.

Proposed New Claims 9-28.

Applicants propose the following new claims.

9. (New) The semiconductor pumping laser device of Claim 1, wherein said device emits light in the 0.98 μm wavelength-band.

Support for New Claim 9:

- page 1, lines 5-11 indicates that the present invention is directed to pumping laser light sources at 0.98 um.
- Page 6, lines 23-26 indicates wavelength band of 0.98 um.

10. **(New)** The semiconductor pumping laser device of Claim 9, wherein the output light of the laser is free of kinks for driving currents up to at least 350 mA, where a kink is a abrupt change of 15% or more in the external differential quantum efficiency of the laser.

Support for Claim 10:

- page 12, lines 26-27 define the 350 mA level.
- page 12, lines 17-21 define the kink as being an abrupt change of 15% or more.

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11. **(New)** The semiconductor pumping laser device of Claim 9, wherein the output light of the laser is free of kinks for driving currents up to at least 700 mA, where a kink is a abrupt change of 15% or more in the external differential quantum efficiency of the laser.

Support for Claim 11:

- page 12, lines 28-29 define the 700 mA level.
- page 12, lines 17-21 define the kink as being an abrupt change of 15% or more.

12. **(New)** The semiconductor pumping laser device of Claim 9, wherein said active layer has no more than two quantum wells, wherein said substrate comprises gallium arsenide, and wherein said laminated structure includes at least gallium and arsenic.

Support for New Claim 12:

- Page 11, lines 22-28 discloses the GaAs substrate and the laminate structure including at least gallium and arsenic.
- Original Claim 4 discloses not more than two quantum well structures.

13. **(New)** The semiconductor laser device according to claim 9, wherein said device has a transverse light confinement structure with the transverse reflective index difference of about $1x10^{-2}$ for oscillation modes.

- Supported by original claim 2.

14. **(New)** The semiconductor laser device according to claim 9, wherein the coefficient of light confinement to the active layer ranges from 1% to 2%.

- Supported by original claim 5.

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15. **(New)** The semiconductor pumping laser device of Claim 1, wherein the light output of the laser device is coupled to a optic fiber such that light from an optical fiber is fed back to the laser device.

- Support: page 10, lines 6-11.

16. **(New)** The semiconductor pumping laser device of Claim 1, wherein said active layer has no more than two quantum wells, wherein said substrate comprises gallium arsenide, and wherein said laminated structure includes at least gallium and arsenic.

Support for New Claim 16:

- Page 11, lines 22-28 discloses the GaAs substrate and the laminate structure including at least gallium and arsenic.
- Original Claim 4 discloses not more than two quantum well structures.

17. **(New)** The semiconductor pumping laser device of Claim 16, wherein said laminated structure further include at least indium and nitrogen.

- Support is provided by the disclosure of GaInNAs material on page 9, lines 22-23.

18. **(New)** The semiconductor pumping laser device of Claim 16, wherein the output light of the laser is free of kinks for driving currents up to at least 350 mA, where a kink is a abrupt change of 15% or more in the external differential quantum efficiency of the laser.

Support for Claim 18:

- page 12, lines 26-27 define the 350 mA level.
- page 12, lines 17-21 define the kink as being an abrupt change of 15% or more.

19. **(New)** The semiconductor pumping laser device of Claim **16**, wherein the output light of the laser is free of kinks for driving currents up to at least 700 mA, where a kink is a abrupt change of 15% or more in the external differential quantum efficiency of the laser.

Support for Claim 19:

- page 12, lines 28-29 define the 700 mA level.
- page 12, lines 17-21 define the kink as being an abrupt change of 15% or more.

20. **(New)** The semiconductor pumping laser device of Claim **16**, wherein the light output of the laser device is coupled to a optic fiber such that light from an optical fiber is fed back to the laser device.

- Support: page 10, lines 6-11.

21. **(New)** The semiconductor laser device according to claim **16**, wherein said device has a transverse light confinement structure with the transverse reflective index difference of about $1x10^{-2}$ for oscillation modes.

- Supported by original claim 2.

22. **(New)** The semiconductor laser device according to claim **16**, wherein the coefficient of light confinement to the active layer ranges from 1% to 2%.

- Supported by original claim 5.

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23. (New) The semiconductor pumping laser device of Claim **1**, wherein the output light of the laser is free of kinks for driving currents up to at least 350 mA, where a kink is a abrupt change of 15% or more in the external differential quantum efficiency of the laser.

Support for Claim 23:

- page 12, lines 26-27 define the 350 mA level.
- page 12, lines 17-21 define the kink as being an abrupt change of 15%

24. **(New)** The semiconductor pumping laser device of Claim **23**, wherein the output light of the laser is free of kinks for driving currents up to at least 700 mA, where a kink is a abrupt change of 15% or more in the external differential quantum efficiency of the laser.

Support for Claim 24:

- page 12, lines 28-29 define the 700 mA level.
- page 12, lines 17-21 define the kink as being an abrupt change of 15% or more.

25. **(New)** The semiconductor pumping laser device of Claim **23**, wherein the light output of the laser device is coupled to a optic fiber such that light from an optical fiber is fed back to the laser device.

- Support: page 10, lines 6-11.

26. **(New)** The semiconductor laser device according to claim **23**, wherein said device has a transverse light confinement structure with the transverse reflective index difference of about $1x10^{-2}$ for oscillation modes.

- Supported by original claim 2.

27. **(New)** The semiconductor laser device according to claim **23**, wherein said active layer comprises no more than two quantum well structures.

- Supported by original claim 4.

28. **(New)** The semiconductor laser device according to claim **23**, wherein the coefficient of light confinement to the active layer ranges from 1% to 2%.

- Supported by original claim 5.